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man also informs me of a fact of which I was ignorant until after my examination was completed, namely, that the stone had been recognized as a meteorite by Prof. C. U. Shepard, Sr., and also by Prof. J. L. Smith, each of whom had obtained a specimen of it.

THE IOLA GAS WELL.

By Prof. G. E. Patrick.

A recent visit to the locality, and a chemical examination of the water, enable me to present a few facts concerning the very interesting natural phenomenon which forms the subject of this paper.

The Iola gas well or mineral well is situated at Iola, Allen county, Kansas, on the line of the Leavenworth, Lawrence & Galveston Railroad. It was sunk in the early part of 1873, not as a well, but as a boring for coal, the occurrence of which as an underlying deposit of that section of country was thought quite probable, though not at all certain, by those best versed in Kansas geology.

A cylindrical diamond drill was employed; and the core taken out, representing the numerous and varied strata passed through, forms an interesting stratigraphical study. The drill was put down 400 feet, and no coal-bed of paying thickness was reached; still the pluck of the managers survived, and with exceptional perseverance they went down without encouragement over 200 feet further. But at a depth of 626 feet they met with a novel change; at that depth the drill suddenly dropped into and through a cavity of about 20 inches in thickness, and water and gas began to be forced up around the drill.

But the object of the boring being neither water nor gas, but coal, with almost unprecedented perseverance the company put their drill down still another hundred feet, but without success; and at a depth of 736 feet gave it up as a lost cause.

The flow of water and gas that commenced at a depth of 626 feet, has continued ever since, and it is a fact worthy of notice that the velocity of the flow has materially increased since that time, the increase being estimated by competent judges as at least 100 per cent.

Soon after the completion of the well, Prof. Stimpson, then of the State University, from measurements made on the spot, estimated the discharge of gas to be about 5,200 cubic feet per day; but from its greatly increased velocity, its daily discharge is now estimated at nearly or quite 10,000 cubic feet. Of water the yield is said to be now about 95 barrels daily.

The velocity of efflux, both of water and of gas, is not at all constant; for the flow is by intermittent pulsations, as must necessarily be the case in such a well. It is not an artesian well in any sense, as the motive power is without doubt the elasticity of the gas that is being constantly generated, or (not to exclude a possible, though I think not a probable explanation) that has been generated and stored up in past times.

This question of the time of the gas generation, whether past or present, cannot, it is true, be answered with entire confidence, but in view of the long time the flow has continued with undiminished force, I think it more than probable that through the agency of internal heat—or perhaps by slow oxidation—vegetable organic matters (common bituminous coals, perhaps) are being to-day decomposed into this light gas and other less volatile compounds. But at what depth in the earth, or how many hundreds of miles away from the Iola well this process is going on, I will not venture even an opinion.

Another point still more theoretical: it seems very probable to me that the cavity found under Iola, from which water and gas are ejected, is of great lateral extent; that it was once occupied by a coal-bed, and that this coal has, as explained above, furnished the gas. The decomposing agency, heat, must then (according to this theory) have acted with considerable energy at a depth of 626 feet below the present surface of the country at Iola. But there is no evidence of extraordinary heat at this locality now; hence, to make the theory consistent with itself, we must assume that the heated area has not been permanent in position but has moved about—an assumption which I think geological science will allow.

To return now from the theoretical unknown to the actual known. The intervals of quiet between the pulsations are of course while water is accumulating in the well, and before the gas has acquired sufficient tension to hurl it out. These intervals I found to be of from 30 to 40 seconds duration; but the proprietor of the well, Mr. Acers, informed me that the duration of the interval is not at all constant, but that at night and before a storm it is shorter, and that the energy of the pulsation is then considerably increased.*

From its quality the gas is better fitted for heating than illuminating purposes, the flame yielded by it being decidedly thin, from its poverty in carbon. But if properly carbonized by passing through gasoline, it would undoubtedly become a very superior illuminating gas. As yet it has not been utilized to any extent.

I have been unable as yet, from lack of time, to examine into the composition of the gas, but hope to do so before long.

Now to turn to the water. It has had attributed to it, upon grounds which I need not here mention, rather marvelous medicinal properties; and now, whatever its virtues may be, it is sold and drunk in large quantities.

The question of its value as a curative agent I do not propose to discuss—that is left with the doctors and the people—but only to give a report of its mineral constituents, and let others decide whether they are medicinal or not. The total solid residue upon evaporation is 16.504 grammes per litre of the water. The ingredients and proportions are as follows. The carbonates of the residue are present in the water as bicarbonates: †

	Grammes in 1 litre of water.
Sodium Chloride, $Na\ Cl$. (Plus $K\ Cl$. small amount)	15.010
Calcium Chloride, $Ca\ Cl_2$	.543
Magnesium Chloride, $Mg\ Cl_2$	.624
Ferrous Carbonate, $Fe\ CO_3$	.023
Calcium Carbonate, $Ca\ CO_3$	.272
Sodium Sulphate, $Na_2\ SO_4$	.019
Sodium Bromide, $Na\ Br$	.004
Silica, $Si\ O_2$ (possibly combined with Na)	.009
Total solids	16.504

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*It is suggested that this phenomenon is caused by the variation in atmospheric pressure. Other similar instances have been reported.

†Because the metric system of weights and measures is used in preference to all others in science, and more especially because it should be used in this country as well as in all others for commercial purposes, I use it here. These figures are of course easily convertible into terms of grains to the gallon, remembering that 1 gramme equals 15.4323 grains; and that 1 litre equals 1.05672 quarts, U. S.

The water also holds in solution a small amount of the hydrocarbon gas (together with carbonic oxide, oxygen and nitrogen), but this seems not to decompose at all during evaporation, as it does not contaminate the solid residue.

The temperature of the water as it issues from the well is constant throughout the year, and is about 61° Fah.

LIST OF COLEOPTERA.

Collected in Colorado in June, July and August, 1876, by the Kansas University Scientific Expedition.

By Prof. F. H. Snow.

Five members of the class of 1876 of the University of Kansas, after commencement, organized a scientific expedition for explorations in Colorado, and invited me to accompany them. The names of the students were as follows: George F. Gaumer, Charles W. Smith, Elmer B. Tucker, Miss May Richardson and Miss Lizzie Williams. My wife and son were also members of the party. Large collections were made of insects, plants, birds, mammals and reptiles, the chief attention being devoted to the first two of these departments. A few minerals were also collected. Three weeks were spent at Colorado Springs, from which point excursions were made to the Plains on the east, to the summit of Pike's Peak, Chiann Canon, and various other localities. Three weeks were devoted to an expedition to the South Park by way of the Ute Pass. During the first week in August the students returned home, but the rest of the party remained in camp in Engelmann's Canon, along the trail of Pike's Peak, until September 1st, making large collections of insects.

Of the material thus accumulated, I have as yet had time to "work up" only a single order of insects, the Coleoptera. In this order three hundred and four species and twelve varieties were collected; among them twelve new species, and one of Thomas Say's "long-lost" species (Dictyoptera sanguinipennis). The list includes a few species taken by Mr. Edwin A. Popenoe, of Topeka ,who spent two weeks in Colorado, and was with us for a single day at Colorado Springs.

For the determination of a large proportion of the species not previously in my collection, I am indebted to Dr. John L. LeConte, of Philadelphia, who will describe the new species discovered by our party. The number prefixed to the names are those of Crotch's "check-list." Instead of using the word "rare" to denote infrequent occurrence of a species, I have preferred to mention the exact number of specimens in each case obtained.

LIST.

CICINDELIDÆ.

1. Amblychila cylindriformis, Say. A single specimen was found dead in a spider's web, in Webster Park, by Mr. Popenoe The rarity and value of this insect may be inferred from the fact that $12 are asked for a single specimen by Eastern dealers.

12. Cicindela longilabris, Say var. South Park, sandy plains, common; differs somewhat from the type-form.

22. Cicindela purpurea, Oliv. var. Audubonii, Lec. South Park; same localities as the preceding.

23. Cicindela cimarrona, Lec. South Park, with the preceding. A large series of the last two forms was taken, convincing Dr. LeConte of what he had long suspected, that they should not be considered distinct species.

25. Cicindela venusta, Lec. A single specimen only, on the plains near Colorado Springs.

27. Cicindela fulgida, Say. Banks of the Platte, in South Park; only five specimens.

28. Cicindela tranquebarica, Hb. var. Two specimens.

30. Cicindela 12-guttata, Dej. Abundant